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THE *HYLAEUS* OF THE BONIN ISLANDS,
WESTERN PACIFIC OCEAN
(Hymenoptera Colletidae)

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ABSTRACT: Four species of *Hylaeus* are known to occur on the Bonin Islands: *H. (Paraprosopis) yasumatsui*, n. sp., *H. ikedai* (Yasumatsu), *H. (Nesoprosopis) boninensis* Yasumatsu and *H. incomitatus*, n. sp. These bees appear to represent a relict fauna with relationships from the Palearctic, Micronesian and Oriental Regions. The zoogeographic peculiarities of each species are discussed. All species are described and illustrated in detail and a key for their separation is provided.

INTRODUCTION

The Bonin Islands are an archipelago representing the peaks of the vast submarine volcanic ridge extending from Tokyo Bay in the north to Guam in the south. They lie between 142° 08' and 142° 12' E and 26° 30' and 27° 50' N. The 97 islands and islets comprising the Bonin Islands are divided into three discrete groups, from north to south: the Muko Jima group, the Chichi Jima group and the Haha Jima group. The combined land area for all the islands is but 72 square kilometers.

The Bonin Islands are the northernmost of the Micronesian islands and are drier than most parts of Micronesia. Warm temperatures during the winter months are maintained through the influence of the Kuroshio Current; average monthly temperatures range from 62° F in January and February to 80° F in August. There is no pronounced wet or dry season, but heaviest rainfall occurs in December, January

and March to August, with an average seasonal total of about 61 inches. The original vegetation was "subtropical jungle" (Gressitt, 1954).

Dr. Karl V. Krombein (1949, 1950) initiated a study of the Aculeate Hymenoptera of Micronesia and has amassed material from a number of institutions. The Bonin Islands *Hylaeus* have been turned over to me by Dr. Krombein and I wish to express my appreciation of his generous cooperation. The material loaned for study included specimens from the Bishop Museum, California Academy of Sciences and Kyushu University. This has been supplemented by four specimens in the Los Angeles County Museum of Natural History.

The figures accompanying this paper were prepared by Ruth Ann DeNicola to whom I am grateful.

Two species of *Hylaeus* have been previously described; *H. ikedai* (Yasumatsu, 1936) and *H. boninensis* Yasumatsu, 1955, both from females. In the material now available there are four species, including Yasumatsu's species. The earlier described species are represented by both sexes and I have described the males of these for the first time. The two additional species are both new and are described below.

ZOOGEOGRAPHY

The Bonin Island insect fauna is a heterogenous assemblage with endemic elements reflecting both Oriental and Micropolynesian relationships. There are also elements of clearly Palearctic origin, representing probable comparatively recent introductions from Japan. A survey of the Bonin Islands floral and faunal relationships indicates that ". . . the Bonins are more properly placed with Micronesia than with the Palearctic Region or the Indo-Chinese or Malayan Subregions of the Oriental Region." (Gressitt, 1954)

The four species of *Hylaeus* presently known from the Bonin Islands also reflect the heterogenous composition of this fauna. These species do not show any close relationship to each other and two species (*H. incomitatus* and *H. ikedai*) cannot now be placed in existing subgenera. One of these, *H. ikedai*, is evidently related to a Japanese species. The Hawaiian subgenus *Nesoprosopis* is represented on the Bonin Islands by *H. boninensis*. This species, however, does not seem to belong to any of the existing Hawaiian species groups. The Palearctic influence is represented in *H. yasumatsui*, n. sp., a member of the Holarctic subgenus *Paraprosopis*. This species is most intriguing from a zoogeographical viewpoint since it is not, apparently, related to any of the *Paraprosopis* of Japan. The male terminalia are similar to those

of a zoogeographically peculiar group including two Nearctic species, *H. calvus* (Metz) and *H. georgicus* (Cockerell), and one Palearctic species, *H. ater* (Saunders). This apparent relationship is borne out by morphological characters of the females. One species, *H. incomitatus*, is wholly enigmatic since it does not seem to be related to any species or species groups known to me. This species is known from a single female and, until the male is known, it is difficult to speculate on its affinities. There is some indication that this species may be related to *H. meridianus* Yasumatsu and Hirashima of the Ryukyu Islands.

The *Hylaeus* fauna of the Bonin Islands may be a relict one. The now largely Hawaiian *Nesoprosopis* possibly at one time occurred over much of Micronesia but would appear to have been replaced, through introduction, with other forms, and now survives at the extreme poles of Micronesia. The subgenus *Paraprosopis*, a temperate Holarctic group, is a primitive one and *H. yasumatsui* may be a survivor of a once very extensively distributed group. The group represented by *H. ikedai* and *H. gnathylaeoides* Bridwell (Japan) may be an endemic one, locally evolved, but I suspect that its affinities may prove to be Oriental.

In the descriptions which follow I have used code abbreviations for some facial measurements. Some of the coded figures are given in millimeters; others in unspecified units. The latter are microscope objective units. Since the ratios involved are my major concern, I have elected to use this system rather than millimeters. Different measuring devices for microscopes will still yield the same ratios.

KEY TO CODED ABBREVIATIONS

ASD. Antennal Socket Diameter. The maximum measurable diameter, between socket rims, in full face view (= "ε" of Hurd and Moure, 1963, fig. 50).

BCW. Basal Clypeal Width. The maximum measurable width of the clypeal base, between the subantennal sutures.

CAD. Clypeo-Antennal Distance. The shortest distance between the juncture of the clypeal and subantennal sutures and the rim of the antennal socket (= "γ" of Hurd and Moure, 1963, fig. 49).

COD. Clypeo-Ocular Distance. Measured from latero-basal clypeal angle and nearest point on margin of compound eye.

HL. Head Length. In full frontal view, the distance from the uppermost part of visible occiput to clypeal apex, along midline.

HW. Head Width. In full frontal view, the maximum measurable head width, including the eyes.

IAD. Inter-Antennal Distance. The least distance between the rims of the antennal sockets (= " α " of Hurd and Moure, 1963, fig. 50).

IOD. Inter-Ocellar Distance. The least distance between the inner margins of the lateral (or posterior) ocelli (= " α " of Hurd and Moure, 1963, fig. 50).

OD. Ocellar Diameter. Maximum diameter of middle (or anterior) ocellus as seen in full frontal view (= " ϵ " of Hurd and Moure, 1963, fig. 50).

OOD. Ocellar-Ocular Distance. Least distance between outer margin of lateral (or posterior) ocelli and inner margin of compound eye (= " β " of Hurd and Moure, 1963, fig. 50).

KEY TO SPECIES

1. Males, antennae with thirteen segments 2
 Females, antennae with twelve segments 4
2. Scape greatly broadened and flattened, much broader than long, with a deep transverse channel behind; third sternite with a large, glabrous tubercle on middle of disc; fourth sternite with a low, shining, arcuate tubercle basally; basal area of propodeum about twice as long as metanotum in middle, roughened basally, with sparse, irregular, longitudinal rugulae which do not reach declivity *ikedai* Yasumatsu
 Scape as long as broad, or longer, not transversely channeled behind; third and fourth sternites simple; basal area of propodeum not as described above 3
3. Scape swollen, no longer than broad; thorax with abundant erect fulvous pubescence; basal area of propodeum strongly sloping, continuous with posterior face, basal triangle shiny, with a few coarse irregular rugulae; pronotal collar largely yellow
 *boninensis* Yasumatsu
 Scape about twice as long as broad; thoracic pubescence sparse, whitish, that of mesoscutum reclinate; basal area of propodeum on thoracic dorsum, rounded behind into declivity, basal triangle slightly shiny, tessellate, with numerous irregular, anastomosing rugulae; pronotal collar immaculate or with two widely separated lateral spots *yasumatsui*, n. sp.
4. Abdomen ferruginous, apically infuscated; axillae and scutellum maculate; propodeal triangle shiny, tessellate, with very short rugulae at extreme base *incomitatus*, n. sp.
 Abdomen wholly dark except translucent tergal margins; axillae immaculate (except *H. boninensis*); propodeal triangle variable 5

5. Axillae, anterolateral mark on scutum, pre-episternum, yellow; thorax largely with abundant long, fulvous pubescence, that of scutum short; basal triangle bare, contrasting with otherwise densely pubescent propodeum; tibiae largely ferruginous; basal triangle of propodeum shiny, largely smooth, with scattered irregular rugulae *boninensis* Yasumatsu

Axillae, scutum and pre-episternum immaculate; thoracic pubescence sparse, white, propodeum very sparsely pubescent; tibiae with small basal yellow spot; basal triangle moderately shiny, tessellate and roughened, with fine, irregular rugulae 6

6. Mesopleura shiny, with distinct, deep punctures separated by a puncture diameter or less; basal face of propodeum as long as scutellum in middle, with fine divergent rugulae on basal two-thirds; pronotal collar immaculate or with two widely separated lateral spots *ikedai* Yasumatsu

Mesopleura moderately shiny, finely tessellate, punctures fine, often obscure, separated by more than a puncture diameter; basal face of propodeum shorter, little longer than metanotum, with fine, irregularly anastomosing rugulae over most of its area; pronotal collar with a continuous transverse stripe, sometimes interrupted medially *yasumatsui*, n. sp.

***Hylaeus (Paraprosopis) yasumatsui*, new species**

Diagnosis: From other Bonin Islands species *H. yasumatsui* may be separated by the black integument with yellow maculae, the densely tessellate and finely, closely punctate mesopleura and the short basal area of the propodeum. The male may be separated from that of *H. ikedai* by the unmodified antennal scape.

MALE (Holotype): *Measurements:* HL = 1.31 mm; HW = 1.21 mm; antenna, scape to 2nd flagellar: 18:7:5:7; IAD = 10; ASD = 8; CAD = 12; BCW = 13; COD = 12; OD = 7; IOD = 14; OOD = 13; wing length = 3.7 mm; length, anterior ocellus to second tergite, 3.1 mm.

Head. Black, the following yellowish: irregular median longitudinal stripe on clypeus; lateral face marks, filling area between eyes and clypeus, terminating irregularly at level of middle of antennal sockets. Mandibular apices ferruginous. Apical spot on first flagellar segment, and entire underside of all succeeding segments, dull ferruginous. Head a little broader than long, inner orbits rather strongly convergent below, UFW 1.8 X LFW. Antennal scape stout, about 1.8 times longer

than greatest width, dorsal surface concave, shiny, Clypeus dull, closely and finely tessellate, with fine punctures separated by twice or more times a puncture diameter on disc, becoming coarser and closer peripherally; maculate areas of face shiny, with sparse, fine punctures. Supraclypeal area high, abruptly narrowed between antennal sockets, rugulose, posterior face steeply sloping. Nonmaculate areas of face slightly shiny, more so below, densely tessellate, punctures a little coarser than on clypeus, punctures contiguous except below where they are separated by about a puncture diameter. Genae, in profile, about half as broad as eyes.

Thorax. Mesoscutum dull, finely and closely punctate, the punctures separated by one-half or less a puncture diameter; scutellum flat, slightly shiny, punctures in center distinctly larger than those of mesoscutum, separated about a puncture diameter; metanotum dull, rugosopunctate; pre-episternum and mesopleura slightly shiny, closely and finely tessellate, with fine, obscure punctures separated by about one-half to a full puncture diameter; metapleura duller than mesopleura, with a few obscure longitudinal rugulae, otherwise densely tessellate and roughened with scattered fine punctures. Propodeal sides shiny, with obscure punctures about equal to those of scutellum, separated by one-half a puncture diameter or less; horizontal basal area a little longer than metanotum, with numerous fine, anastomosing rugulae basally, most of which fail to reach summit of declivity; oblique and transverse carinae absent, lateral carina present, strong; declivitous face and area of basal face between lateral carina and margins of basal triangle slightly shiny, irregularly roughened and tessellate, but without evident punctures. Black, the following yellowish: linear spots laterally on pronotal collar, minute apical spot on fore femora, broad external stripe on fore tibiae, minute basal spot on mid tibiae and short basal stripe on hind tibiae. Wings hyaline, brownish, veins and stigma brown.

Abdomen. First tergite shiny, weakly tessellate, with scattered fine, piligerous punctures; second tergite duller, more tessellate, with abundant shallow piligerous punctures which are distinctly larger than those of first segment; third to sixth tergites much as second, but punctures more obscure; third and fourth sternites simple; sternites weakly tessellate and shiny, with abundant coarse, piligerous punctures. Terminalia: Fig. 1c-e.

Pilosity. Hairs sparse on head, those of face and genae whitish, those of vertex and scape fulvous; some on scape as long as maximum scape width. Erect hairs of thorax variable, with abundant short, fulvous hairs, especially dorsally; longer, weakly barbed whitish hairs scattered on dorsum, especially on scutellum and pleurae; propodeal sides and

interior with abundant weakly plumose, suberect to erect, pubescence which does not obscure surface. Abdomen with numerous long, simple fulvous hairs, a little denser on tergal margins, appressed basally, becoming more nearly erect caudad; ventrally with scattered reclinate to erect whitish and fulvous hairs intermixed.

FEMALE (Allotype): *Measurements*: HL = 1.36 mm; HW = 1.49 mm; antenna, scape to 2nd flagellar, 25:9:7:6; IAD = 14; ASD = 8; CAD = 7; BCW = 21; COD = 15; OD = 8; IOD = 14; OOD = 14; wing length = 4.3 mm; length, anterior ocellus to margin of second tergite, 4.1 mm.

Head. Black, a short longitudinal median stripe on clypeus and broad lateral face marks ending acutely at eye margin slightly above level of upper margin of antennal sockets, yellowish. Head a little broader than long, inner orbits convergent below, UFW 1.4 times LFW. Mandibles broad, apically bidentate, apical tooth short, triangular, inner margin of inner tooth oblique. Clypeus 1.15 times longer than wide, slightly shiny, finely and closely tessellate, with scattered fine, obscure punctures on disc, preapically with punctures coarser and closer; apical margin distinctly emarginate, the emargination weakly angulate. Maculate areas of sides of face and lower face of supra-clypeal area finely and closely tessellate, slightly shiny, with fine obscure punctures, mostly separated by a puncture diameter or more. Nonmaculate areas of face more coarsely, subcontiguously punctate, interspaces dull, densely tessellate, especially on frons; vertex, between eyes and ocelli, a little more shiny, punctures sparse; occipital area moderately shiny, punctures finer than those of frons, separated by about half a puncture diameter. Genae, in profile, a little narrower than eyes, slightly shiny, finely longitudinally striolate, with sparse, fine, obscure punctures. Facial foveae above curved away from eye margin, ending about midway between eyes and ocelli.

Thorax. Black, elongate maculae on pronotal collar, attenuated toward middle and separated by about one-half their length, posterior half of pronotal lobe and basal spot on all tibiae, yellowish. Mesoscutum dull, very densely tessellate, finely punctate, punctures separated by a puncture diameter or less. Scutellum shinier, punctures distinctly coarser than those of mesoscutum, separated by a puncture diameter or less. Metanotum matt, very finely tessellate and roughened, with some fine, obscure punctures. Mesopleura and pre-episternum slightly shiny, tessellate, with punctures about as fine as those of mesoscutum, separated by one to two puncture diameters. Metapleura with very fine longitudinal striae, roughened and irregularly finely punctate. Propodeal sides shiny, with close, coarse punctures larger than those

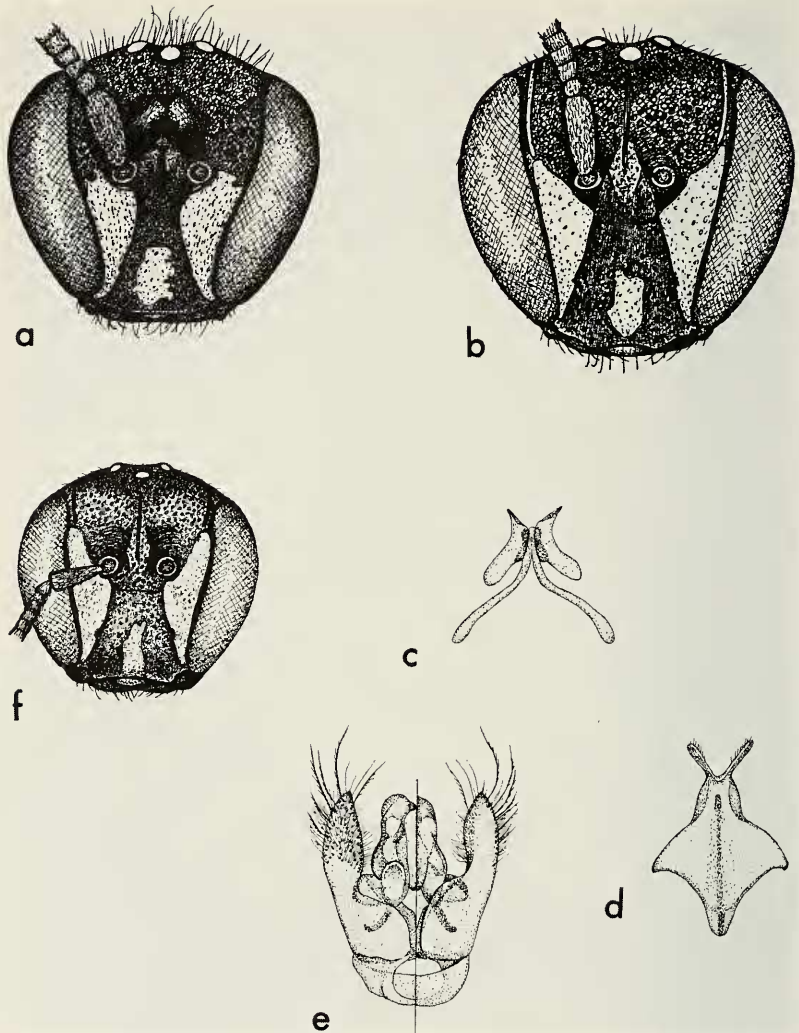


Figure 1. *H. (Paraprosopis) yasumatsui*, n. sp.: a, male face; b, female face; c, sternite VIII; d, sternite IX; e, genitalia, right half dorsal aspect, left half ventral aspect. *H. incomitatus*, n. sp.: f, type female face.

of scutellum; basal triangle duller, more densely tessellate, basal two-thirds with abundant moderately coarse anastomosing rugae, a few of which attain summit of declivity; lateral portions of basal area and declivitous face slightly shiny, tessellate and roughened, with scattered punctures and fine rugulae, especially laterally; lateral carina present;

oblique and transverse carinae absent. Tibial spurs dirty-white. Wings brownish hyaline, veins and stigma brown.

Abdomen. First tergite polished, impunctate over much of area, with a few fine piligerous punctures at sides; second tergite duller, but still shiny, finely and lightly tessellate, with numerous fine, obscure piligerous punctures; succeeding tergites similar to second but becoming progressively duller caudad.

Pilosity. Similar to that of male, but denser on propodeum; inner side of hind basitarsi with dense, white, flattened reclinate pubescence.

HOLOTYPE male and allotype (U.S. National Museum, No. 70756), Okimura, Haha Jima, Bonin Islands, April 26 to June 9, 1958 (F. M. Snyder).

Paratypes: 1 ♂, 3 ♀♀, same data as holotype; 1 ♂, 1 ♀, Yoake Yama, Chichi Jima, April 21, 1958 (F. M. Snyder); 1 ♂, 2 ♀♀, "camp beach," Omura, Chichi Jima, May 5 to June 9, 1958 (F. M. Snyder); 3 ♀♀, "mulberry beach," Chihiro-iwa, Chichi Jima, April 11-12, 1958 (F. M. Snyder); 3 ♀♀, SE Bay, Tatsumi Wan, Chichi Jima, April 11-22, 1958 (F. M. Snyder); 2 ♀♀, Chichi Jima, July 10, 1951 (R. M. Bohart). Paratypes are deposited in the collections of the Bishop Museum, California Academy of Sciences, Los Angeles County Museum of Natural History and United States National Museum.

Paratyptic variation. The few available males of this species are, for the most part, fairly uniform. One specimen, from Omura, is much smaller than the other males. The length of this specimen, from the anterior ocellus to the margin of the second tergite is only 2.0 mm, *versus* 3.1 to 3.2 for the other males. There are, of course, corresponding differences in head proportions. Within the series of males, the head width ranges from 1.16 mm to 1.44 mm; the upper facial width/lower facial width figures extend from 47/25 to 52/31.

There is some variation in the extent of the maculae. The paratype male from Okimura has the lateral face marks short, failing to reach the level of the lower margin of the antennal sockets. In this same specimen, the pronotal collar is immaculate, the mark on the pronotal lobe is reduced to a small spot on the lower margin and the hind tibiae are without a basal spot. At the opposite extreme is the male from Yoake Yama in which the clypeus is largely yellow (black only along the sutures), the pronotal collar maculae are separated by only one-half their lengths, all tibiae have large basal maculae (the left mid tibia has a narrow yellowish stripe along its entire length), and the hind basitarsi are yellowish on the basal one-third.

The larger series of females exhibits a greater range of variation. Length, as defined above, varies from 3.5-4.6 mm. Head width ranges

from 1.37 to 1.59 mm, with the Cephalic Index ($CI = \frac{(HL)(100)}{HW}$) varying from 89.7 to 93.5. The upper facial width is from 1.3 to 1.4 times the lower facial width. Details of sculpturation and pilosity are quite uniform. As is true of the males, there is considerable variation in the extent of the maculae. In most of the females, the clypeal stripe is restricted to the lower third, or less, of the median length, but two have the stripe extending nearly the entire length, while others are intermediate. The lateral face marks are more uniform, but in one specimen do not extend above the antennal sockets. The two females with the longest clypeal stripes (those collected by Bohart) are more extensively maculate on the pronotal collar, as would be expected. In one the pronotal collar mark is entire and in the other it is very narrowly interrupted medially. The tegular maculae may be present or absent. Some females have the tergal margins yellowish translucent; in others they are brownish.

None of the above variations are correlated with distribution; this species is so far known from two islands, Chichi Jima and Haha Jima. The male of *H. yasumatsui*, in Bridwell's (1919) key runs to "*Hylaeus* sp." in the last couplet. Bridwell's comments on that species indicate, by inference, that his specimen should belong to the subgenus *Prosopis*. The present species, on the other hand, seems more nearly allied to the *H. calvus* (Metz) group of the subgenus *Paraprosopis*. Included in this group are *H. calvus* (Metz) and *H. georgicus* (Cockerell) in the Nearctic Region and *H. ater* (Saunders) in the Palearctic Region. The distribution of the species in this group is now highly disjunct, indicating that the group may once have been extensively distributed in temperate areas. As the *Hylaeus* fauna of the world becomes better known it may be that additional species may be placed in this group and its distribution and evolution better understood.

This species is dedicated to Dr. Keizo Yasumatsu who has contributed greatly to our understanding of the Hymenoptera of Asia.

Hylaeus ikedai (Yasumatsu)

Figure 2

Prosopis ikedai Yasumatsu, 1936.

Hylaeus ikedai, Yasumatsu, 1955.

Diagnosis: Male immediately separable from other Bonin Islands species by the expanded scape which is much broader than long and the presence of a polished, glabrous swelling on the third sternite. The female most closely resembles *H. yasumatsui* but may be recognized

by the shiny, densely punctate mesopleura and the long basal propodeal area.

MALE: Measurements: HL = 1.34-1.44 mm; HW = 1.41-1.51 mm; antenna, scape to 2nd flagellar: 23-25; 6-7:7:6-8; IAD = 12-13; ASD = 8-9; CAD = 14-15; BCW = 13-15; COD = 15-16; OD = 7-8; IOD = 12-14; OOD = 13-17; wing length = 3.7-4.1 mm; length, anterior ocellus to margin of second tergite, 3.2-3.7 mm.

Head. Black, the following pale yellowish: broad mandibular stripe; labral tubercule; clypeus, except margins; broad lateral face marks, ending bluntly slightly above level of antennal sockets; broad stripe on ventral, narrow stripe on dorsal margins and most of inner face of scape. A small yellow spot present on supraclypeal area; one specimen (from Nishi Jima) possesses a small yellow spot on the gena at about one-third of the distance from the lower to upper eye margins. Flagellum light ferruginous beneath. Clypeus dull, closely tessellate, with fine, close elongate punctures; supraclypeal area slightly shiny, finely lineolate, with scattered obscure punctures; maculate areas of face moderately shiny, closely tessellate, with fine scattered punctures; non-maculate areas slightly shiny, densely and finely punctate, with closely tessellate interspaces; area between eyes and ocelli slightly to moderately shiny, tessellate, with well separated fine punctures; genae moderately shiny, lightly tessellate and lineo-punctate. Eyes, in profile, about 1.5 times broader than genae. Antennal scape expanded, from 1.2 to 1.4 times broader than long; inner face transversely concave, concavity dull.

Thorax. Mesoscutum slightly shiny, lightly and closely tessellate, finely punctate, punctures separated by a puncture diameter or more; scutellum slightly shiny, lightly and closely tessellate, finely punctate, punctures little, if any, larger than those of mesoscutum, irregularly spaced from one-half to nearly two puncture diameters apart; metanotum flattened, very finely and closely tessellate, without evident punctures; mesopleura moderately shiny with fine tessellation, closely punctate, punctures much larger than those of mesoscutum, separated by one-half to a puncture diameter; metapleura finely longitudinally striate, densely tessellate and slightly shiny, with scattered obscure punctures. Propodeal sides densely tessellate and slightly roughened, slightly shiny, with obscure, shallow punctures; basal area of propodeum very nearly as long as scutellum, basal two-thirds with fine irregular anastomosing rugulae, slightly shiny, closely tessellate; latero-basal area coarsely and closely punctate; remainder of propodeum densely tessellate, slightly shiny, irregularly punctate and roughened; lateral, oblique and transverse carinae absent. Black, with the following

yellowish: pronotal lobe; tegular spot; minute apical femoral spot; complete outer stripe on fore tibia; basal and apical maculae on mid and hind tibiae; all basitarsi. Remaining tarsal segments ferruginous, becoming darker distally.

Abdomen. First tergite lightly tessellate, moderately shiny, with sparse, fine, piligerous punctures; second tergite with strong gradular carina, slightly and closely tessellate, slightly shiny, with coarser, closer punctures than first tergite; succeeding tergites similar to second, but punctures progressively more indistinct caudad; third sternite with a large, ventrally flattened, glabrous semicircular basal tumescence; fourth sternite with a short, transverse, glabrous preapical tumescence. Blackish-brown, tergites and sternites with broad yellowish-translucent apical margins. Terminalia: Fig. 2c-e.

Pilosity. Erect hairs sparse on face, short; vertex with numerous much longer hairs; genae, especially below, with abundant long, plumose pubescence; thoracic dorsum with sparse, simple, erect hairs and scattered longer, simple hairs; thoracic and propodeal sides with sparse, long, weakly to distinctly plumose pubescence; propodeal interior with denser, shorter, plumose pubescence; first tergite with sparse, short, erect hairs; second and third tergites with denser, longer hairs, fourth and remaining tergites with hairs sparser; sternites with long, sparse hairs; hairs and pubescence whitish, sometimes tinged with fulvous, especially on tergites.

FEMALE. To the adequate characterization of the female of this species given by Yasumatsu (1936) I wish to add the following:

Measurements. HL = 1.19-1.40 mm; HW = 1.32-1.47 mm; IAD = 14; ASD = 7-8; CAD = 6-10; BCW = 17-20; COD = 15-17; OD = 6-7; IOD = 13; OOD = 15-16.

In all females examined the pronotal collar is wholly black. The preapical clypeal spot may be present or absent. Of the seven females seen, two possess a distinct clypeal macula, four lack it and one has the preapical area reddened. The mesopleural punctures are distinctly coarser than those of the mesoscutum, separated by about a puncture diameter, the interspaces lightly tessellate and shiny. None of the variation noted for either sex seems correlated with distribution.

SPECIMENS EXAMINED. 1 ♀, Ogasawara, 1934? (Ikeda and Okabe); 1 ♂, 2 ♀♀, Chichi Jima, July 10, 1951 (R. M. Bohart); 1 ♂, 1 ♀, Chichi Jima, June 1959 (J. Yoshiyama); 1 ♂, 1 ♀, "camp beach," Omura, Chichi Jima, May 5-June 9, 1958 (F. M. Snyder); 1 ♂, Kammuri-iwa (SW bay), Ototo Jima, June 3, 1958 (F. Snyder and W. Mitchell); 1 ♀, Sen-zan (NE bay), Ani Jima, May 28, 1958 (F. M. Snyder); 1 ♂, Nishi

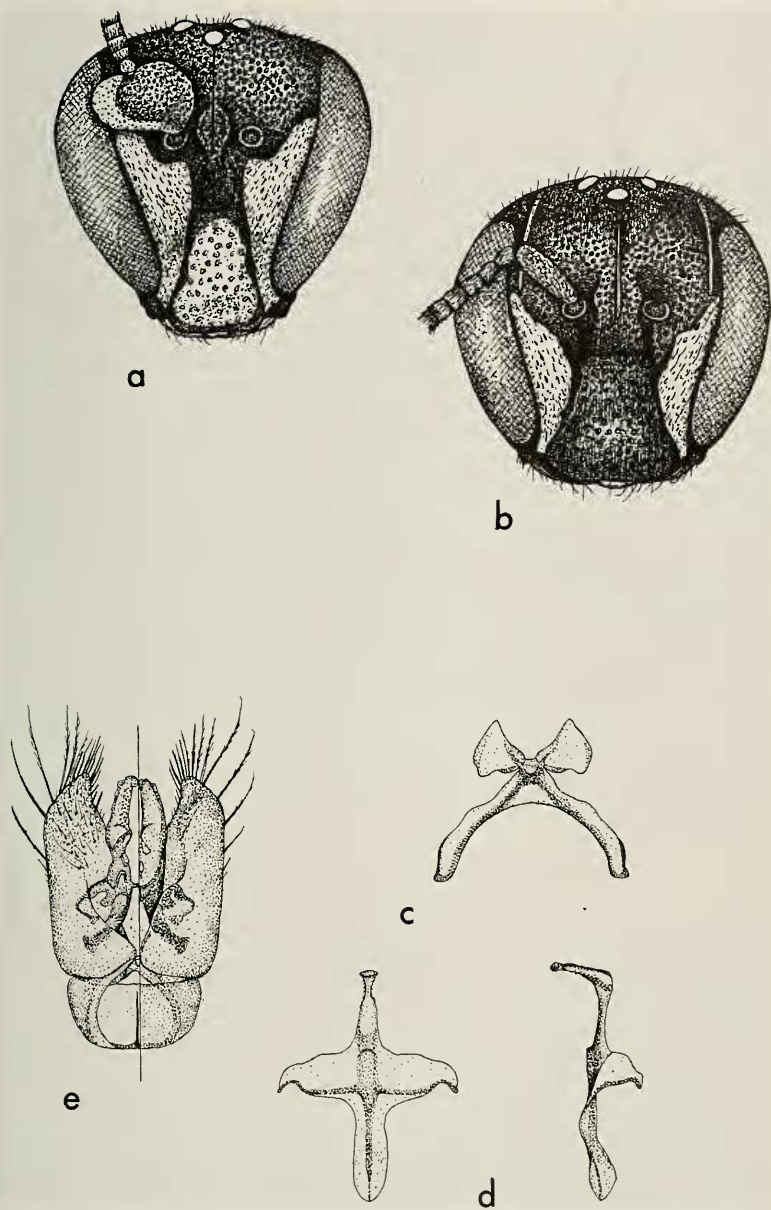


Figure 2. *H. ikedae* Yasumatsu: a, male face; b, female face; c, sternite VIII; d1, sternite IX, lateral (left) and apico-ventral (right) aspects; d2, sternite IX, dorsal aspect; e, genitalia, right half dorsal aspect, left half ventral aspect.

Jima, May 22, 1958 (F. Snyder and W. Mitchell); 1 ♀, Okimura, Haha Jima, April 26-June 9, 1958 (F. M. Snyder).

Yasumatsu (1936) originally compared this species with *H. paulus* Bridwell of Japan. The discovery of the male of *H. ikedai* has enabled me to arrive at a closer comparison with another Japanese species. Although I have not examined any material of *H. gnathylaeoides* Bridwell, the original description of that species leaves little room for doubt that *H. ikedai* is closely related. The male of *H. gnathylaeoides* has the scape "enormously enlarged" and the "third sternite with a spine on either side of the disc and connected by a ridge." The description of the eighth and ninth sternites closely matches the basic characters of these structures in *H. ikedai*. The female of *H. gnathylaeoides*, judging from the description, is very similar to that of *H. ikedai*; it would be necessary to compare the two to be certain of differentiating characters. In *H. gnathylaeoides* the pronotal collar is maculate (black in *H. ikedai*), the clypeal macula is a broad longitudinal stripe (a preapical spot, or absent, in *H. ikedai*), the metanotum is rugulose (tesselate with scattered punctures in *H. ikedai*) and the mesopleural punctation is similar to that of the mesoscutum (much coarser in *H. ikedai*).

Together these species would seem to form a distinctive element within the Micronesian fauna, one which may eventually prove worthy of subgeneric recognition. I believe that until the entire Palaearctic, Oriental and Micronesian *Hylaeus* fauna can be critically studied that the erection of a new subgenus at this time might only add to the confusion.

Hylaeus (Nesoprosopis) boninensis Yasumatsu

Figure 3

Hylaeus boninensis Yasumatsu, 1955.

Diagnosis: Easily separated from other Bonin Islands species by the wholly maculate pronotal collar, wholly yellow or light ferruginous legs, maculate axillae and dark abdomen. The mesopleura are shiny and closely punctate in both sexes and the male antennal scape is nearly as broad as long.

MALE: *Measurements:* HW = 1.61-1.85 mm; HL = 1.51-1.75 mm; antenna, scape to 2nd flagellar: 2-26, 8, 5-6, 9-10; IAD = 7-9; ASD = 11-12; CAD = 15-19; BCW = 12-15; OOD = 15-17; OD = 10-11; IOD = 15-18; OOD = 15-18; wing length = 4.1-4.9 mm; length, front ocellus to margin of second tergite, 4.0-4.6 mm.

Head. Black, the following yellowish-white: mandibles, except

ferruginous apices; small mediobasal spot on labrum; clypeus; large lateral face marks, ending abruptly on a level midway between antennal sockets and ocelli; supraclypeal area, ending acutely between antennal sockets; narrow ventral stripe on scape. Flagellar segments beyond first dull ferruginous beneath. Head a little broader than long, inner orbits distinctly convergent below (UFW about 1.5 times LFW). Antennal scape broad, from 1.2 to 1.3 times longer than broad, somewhat concave on dorsal surface. Clypeus slightly shiny, finely tessellate, with numerous fine, oval punctures becoming coarser and closer toward apex; supraclypeal area (maculate portion) dull, finely lineolate, with scattered fine punctures peripherally; sides of face, between antennae and inner orbits distinctly longitudinally depressed, maculate areas somewhat shiny, with scattered fine punctures; nonmaculate areas finely, closely punctate, the interspaces slightly shiny; area between eyes and ocelli polished, with scattered punctures; foveae above curved away from eye margin, ending a little nearer to eyes than to ocelli; genae about one-half as wide as eyes in profile, finely, densely punctate, with shiny interspaces.

Thorax. Mesoscutum finely and closely punctate, punctures separated by half a puncture diameter or less, interspaces shiny, very lightly tessellate. Scutellum closely punctate, punctures subcontiguous and a little coarser than those of mesoscutum, interspaces shiny and very lightly tessellate. Metanotum rugulose, slightly shiny, closely tessellate. Preepisternum and mesopleura closely punctate, punctures coarser than those of scutellum, interspaces polished; metanotum with distinct well spaced longitudinal raised striae, interspaces shiny, lightly tessellate, with shallow, obscure punctures. Propodeal triangle shiny, surface lightly roughened, with a few coarse rugae defining several large areolae, and with a few finer, irregular rugulae; lateral area coarsely and closely punctate, with shining interspaces; propodeal declivity and latero-basal areas slightly shiny, with variably spaced punctures of several sizes, these more pronounced toward sides and base; lateral carina high and sharp, oblique and transverse carinae absent; pits on either side of abdominal insertion prominently carinate in front.

Black, the following yellow: anterior margin of pronotum; entire dorsal surface of pronotal collar, confluent with macula of pronotal lobe; large spot on antero-lateral corner of mesoscutum (absent in some specimens); large tegular spot; axillar spot; apical spot on all femora; ventral stripe on fore femora and obscure ventral blotch on mid femora; all tibiae and tarsi (distitarsi darker ferruginous), the latter tending to become light ferruginous. Wings faintly brownish-hyaline, veins and stigma brown.

Abdomen. First tergite polished, with scattered, fine piligerous punctures; second tergite shiny, with scattered piligerous punctures, surface rather closely tessellate, gradulus sharply carinate; third and following tergites similar to second, but duller, more densely tessellate and with punctures more clearly defined; sternites more coarsely punctate, moderately shiny. Terminalia: see fig. 3c-e.

Blackish-brown, apical margins of tergites and sternites broadly yellowish-translucent.

Pilosity. Sparse on front of head, but clypeus with numerous reclinate, weakly barbulate yellowish-white hairs; vertex with abundant erect hairs of variable length, these light fulvous, weakly barbulate; genae with abundant long, erect yellowish-white pubescence; thoracic dorsum with abundant short, erect fulvous weakly to moderately barbulate hairs and scattered longer, weakly barbulate hairs; thoracic sides with abundant long, fulvous pubescence; sides and interior of propodeum with a dense covering of short, whitish pubescence and abundant long, fulvous pubescence. Anterior and lateral faces of first tergite with numerous short, erect simple to moderately barbulate hairs; succeeding tergites with abundant long, reclinate fulvous hairs and shorter, depressed whitish pubescence on margins; sternites with scattered short, reclinate whitish to fulvous pubescence and scattered, longer hairs.

FEMALE. Most details of the female have been adequately described by Yasumatsu (1955). The following additional details will supplement that description.

Measurements: HW = 1.86 mm; HL = 1.66 mm; IAD = 17; ASD = 10; CAD = 11; BCW = 26; COD = 19; OD = 12; IOD = 17; OOD = 20; wing length, 5.1 mm; length, anterior ocellus to margin of second tergite, 4.9 mm.

Upper facial width 1.25 times lower facial width; facial foveae ending at about midpoint between eyes and ocelli; first tergite with abundant erect weakly barbulate to plumose hairs; punctural interspaces on thorax lightly tessellate, moderately to strongly shiny.

SPECIMENS EXAMINED: 1 ♂, Chichi Jima, July 10, 1951 (R. M. Bohart); 1 ♂, 1 ♀, Chichi Jima, June, 1959 (J. Yoshiyama); 2 ♂♂, "camp beach," Omura, Chichi Jima, May 5 to June 9, 1958 (F. M. Snyder).

This species seems to be fairly uniform in its characters; there is some variation among the males in the extent of the mesoscutal maculation. This maculation may be present as a conspicuous quadrate mark, reduced to a small round spot or wholly absent. Larger series would probably reveal more extensive variation.

The terminalia of the male, especially the configuration of the

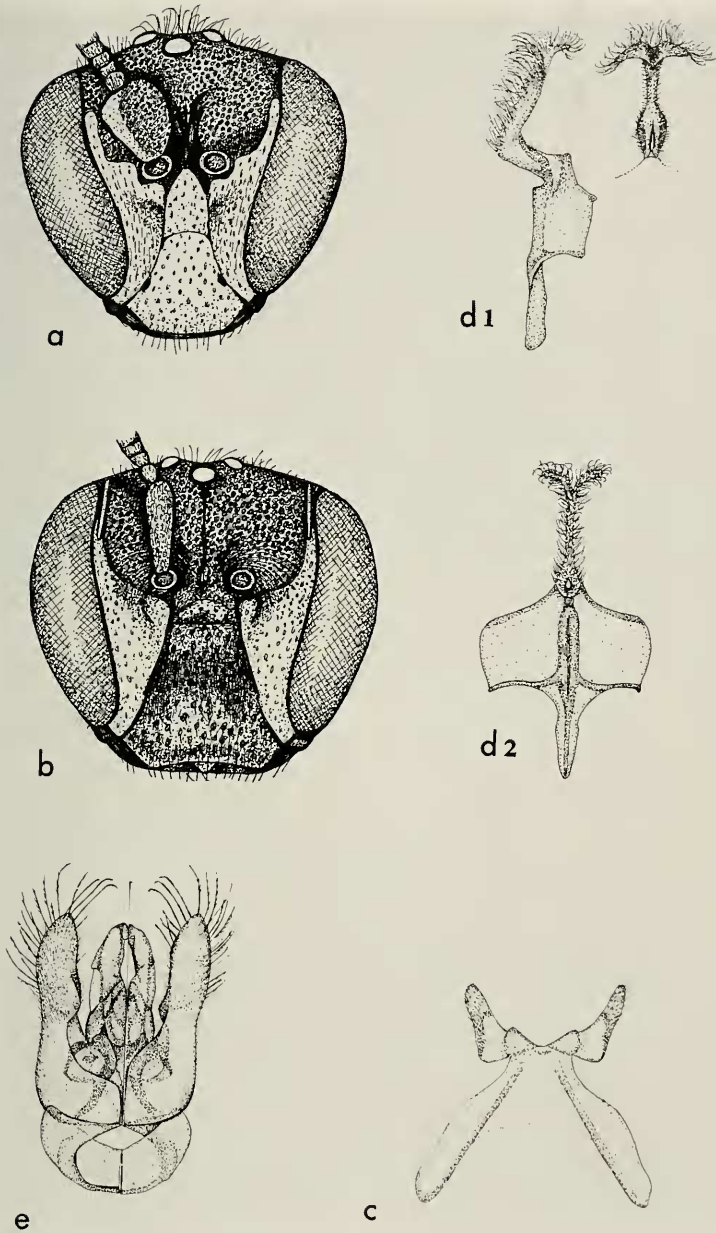


Figure 3. *H. (Nesoprosopis) boninensis* Yasumatsu: a, male face; b, female face; c, sternite VIII; d, sternite IX; e, genitalia, right half dorsal aspect, left half ventral aspect.

eighth and ninth sternites, are very similar to those of species assigned to the Hawaiian subgenus *Nesoprotopis*. I can find nothing at this time to argue against inclusion of this species in that subgenus.

***Hylaeus incomitatus*, new species**

Figure 1f

Diagnosis: This species may be immediately separated from its congeners on the Bonin Islands by its small size, maculate axillae and ferruginous abdomen.

FEMALE: Measurements: HL=0.95 mm; HW=1.08 mm; antenna, scape to 2nd flagellar: 22:8:6:5; IAD=16; ASD=8; CAD=8; BCW=22; COD=14; OD=7; OOD=14; IOD=12; wing length=3.0 mm; length, anterior ocellus to margin of second tergite, 2.9 mm.

Head: Black, the following pale yellowish: irregular median longitudinal stripe on apical three-fourths of clypeus and broad lateral face marks, terminating bluntly at lower end of facial foveae; transverse basal spot on mandibles. Apical margin of clypeus and mandibular apex ferruginous. Underside of scape and flagellum dull ferruginous, upperside blackish-brown. Mandible broad, with two apical teeth. Clypeal apex broadly concave, disc slightly shiny, densely tessellate, with scattered obscure punctures; maculate areas of face slightly shiny, densely tessellate, with scattered obscure punctures; supraclypeal area less shiny, more densely and finely tessellate, with irregularly spaced fine punctures at sides; frons and vertex finely, closely punctate, with moderately shiny interspaces; occipital punctures separated by a puncture diameter or more; facial foveae above ending near midpoint between eyes and ocelli; genae as broad as eyes, moderately shiny, with scattered, obscure fine punctures.

Thorax: Black, the following pale yellowish: anterior margin, collar and posterior lobes of pronotum; anterior spot on otherwise transparent tegulae; axillae; short, oblique line on scutellar sides; apical spot on all femora; basal stripe on all tibiae. Legs otherwise dull to light ferruginous. Mesoscutum and scutellum slightly shiny, with fine, close punctures; metanotum duller, with a few obscure punctures; prepisternum and mesopleurae shinier, with fine punctures separated by a puncture diameter or more, punctures somewhat obscured by dense tessellation; metapleura moderately shiny, without striae, but with a few fine, obscure punctures. Propodeum lacking lateral, oblique and transverse carinae; basal area essentially horizontal, longer than metanotum in middle, with a few short, irregular rugulae basally; juncture of dorsal and posterior faces a well-rounded curve.

Abdomen: Ferruginous, broad apical margins lighter, more yellowish; apical segments darker; tergites shiny, very finely transversely lineolate, with scattered very fine piligerous punctures.

Pilosity: Everywhere sparse, whitish, consisting of short, appressed simple hairs and scattered longer simple hairs; propodeum, except basal triangle, with denser, weakly plumose, reclinate pubescence which does not obscure surface; abdominal tergites without marginal fasciae, discs with scattered simple hairs which become longer, more abundant and more erect caudad; ventral hairs similar.

HOLOTYPE female (United States National Museum, No. 70755), Southwest Bay, Ani Jima, Chichi Jima Group, Bonin Islands, May 17, 1958, collected by F. M. Snyder.

This small species does not appear to be closely related to any of its congeners on the Bonin Islands, nor does it show any obvious relationship to the species of the Japanese Islands.

The specific name is a Latin word meaning unaccompanied or alone, in reference to its lack of obvious relatives and to the lack of additional specimens.

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